

SIEMENS

UROSKOP ACCESS

SP

Maintenance Instructions

System

For FLUOROSPOT Compact/Aspia Image System

The protocol SPL5-330.832.01.04.02 is required for these instructions

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1 Prerequisites and Information

1.1 General information

1.1.1 Important information from the manufacturer

- The original version of this document was written in German.
- The illustrations and drawings may differ slightly depending on the actual system.

1.1.2 Maintenance intervals

- Maintenance should be performed every 12 months.

1.1.3 Maintenance information

- Damaged or worn parts must be replaced with original parts.
- The Inspection and Maintenance Checklists must be filled out and signed by the CSE (Customer Service Engineer). Repairs and procedures not included in the checklists must be listed separately.

1.1.4 Required documents

Tab. 1

User Instructions for TFT Support Arm from the Ondal Company	n.a.
Montageanweisung TFT-Tragarmsysteme URO-SKOP Access der Firma Ondal/Monitor Swivelling Arm, Supplement to the Operator Manual URO-SKOP Access"	SPL5-330.621.35
"Safety Technical Checks" ¹	SP00-000.834.01...
Qualitätssicherung; IQAP (for FLUOROSPOT Compact image system)	SPL5-330.820.02
Qualitätssicherung; System; Bildqualitäts-Quick-Test (for ASPIA image system)	SPL5-330.820.02
Safety Information; System; General Safety Notes	TD00-000.860.01...
Safety and Radiation Safety Guidelines	ARTD Part 2
Maintenance Certificate	SPL5-330.832.01

1. Within the purview of DIN VDE 0751-1, we recommend documenting the maintenance results both in the Maintenance Certificate and in the "Sicherheitstechnische Kontrollen" Certificate. The protocols should be filled out completely and then handed to the customer. This document is available only in German

1.1.5 Abbreviations

Tab. 2

BV	Image intensifier
DL	Fluoroscopy
DR	Exposure
SID	Source-image distance (SID)
FLC	FLUOROSPOT Compact
f/s	Frame/s (Frame/s)
OGP	Organ program
STK	Technical safety checks
SSW	Service software

1.2 Product-specific notes

1.2.1 Explanation of abbreviations in the maintenance certificate

Abbrev.	Explanation
SI	Safety inspection
SIE	Electrical safety inspection
SIM	Mechanical safety inspection
PM	Preventive maintenance
PMP	Periodic preventive maintenance
PMA	Preventive maintenance adjustments
PMF	Preventive check of operating values/functions
Q	System quality, image quality
QIQ	Image quality
QSQ	System quality
SW	Software maintenance
CSE	Customer Service Engineer
KS K No.	Customer-specific code
IVK	Installed volume component
WE	Maintenance unit

The work steps provided with these abbreviations are included in the maintenance protocol as checkpoints and should be checked off after their completion.

NOTE

The sequence for complete inspection and maintenance is provided in the following pages.

Each step must be performed annually, unless otherwise specified.

1.2.2 Applicability to UROSKOP Access Version

NOTE

This document refers to UROSKOP Access Systems, both with the ASPIA image system as well as with the FLC image system. The requirements for maintenance on the FLC image system are described in the chapter "FLUOROSPOT Compact".

1.2.3 Technical Safety Checks (STK)

NOTE

Within the purview of DIN VDE 0751-1, the operator of medical engineering products has to perform technical safety checks in regular intervals.

A separate protocol (SP00-000.834.01) is available for the technical safety checks.

Within the purview of DIN VDE 0751-1, we recommend documenting the maintenance results both in the Maintenance Certificate and in the “Sicherheitstechnische Kontrollen” Certificate. The certificates should be filled out completely and then handed to the customer.

The following table assigns the appropriate maintenance work steps described in this document to each check in the “Sicherheitstechnische Kontrollen” Certificate.

“Sicherheitstechnische Kontrollen” Certificate	Maintenance instructions/protocol
1. Identification data	Fill out the corresponding fields in the maintenance protocol.
2. General checks	n.a.
2.1 Visual inspection: Is there any damage affecting safety?	<p>2.1 Maintenance of the lifting base</p> <ul style="list-style-type: none"> • PMP Checking the basic unit <p>2.2 Maintenance of the Unit Support</p> <ul style="list-style-type: none"> • PMP, Patient Tabletop, Sealer Ring <p>2.3 Maintenance of the cassette box</p> <ul style="list-style-type: none"> • SI Covers on the catapult bucky <p>4.1 Checks</p> <ul style="list-style-type: none"> • PM Checking the tableside control unit for proper functioning and damage • PM Checking the fluoro and exposure footswitch for proper functioning and damage • PM Checking the system footswitch for proper functioning and damage

"Sicherheitstechnische Kontrollen" Certificate	Maintenance instructions/protocol
2.2. Are all cables and cable guides secure and without any visible damage?	<p>2.1 Maintenance of the lifting base</p> <ul style="list-style-type: none"> • SIM Checking the cables and corrugated hoses <p>2.3 Maintenance of the cassette box</p> <ul style="list-style-type: none"> • SI Covers on the catapult bucky <p>4.1 Checks</p> <ul style="list-style-type: none"> • PM Checking the tableside control unit for proper functioning and damage • PM Checking the fluoro and exposure footswitch for proper functioning and damage • PM Checking the system footswitch for proper functioning and damage
2.3 Is there any damage to the accessories being used?	<p>4.1 Checks</p> <ul style="list-style-type: none"> • SI Functional test of safety equipment - electrical/mechanical
2.4 Are all unit radiation protection devices present and undamaged? (No on-site radiation protection)	<p>3.2 Evaluation</p> <ul style="list-style-type: none"> • QIQ Coincidence of light field and radiation field • QIQ Coincidence of radiation field size and indicated field sizes • QIQ Coincidence of radiation field center and film center • QIQ Checking the fluoroscopic field limitation • QIQ, Image Quality, ASPIA Image System • QIQ, Image Quality, FLC Image System <p>4.1 Checks</p> <ul style="list-style-type: none"> • SI Functional test of safety equipment - electrical/mechanical • PM Checking the collimator control elements
2.5 Are the required operator documents complete, available, legible?	Not included in the maintenance instructions, but part of the technical safety checks (STK); the operator must present the operator documents or review them personally.
2.6 Are all warning labels in place and recognizable?	<p>4.1. Checks</p> <ul style="list-style-type: none"> • SI Warning labels

"Sicherheitstechnische Kontrollen" Certificate	Maintenance instructions/protocol
2.7 Are the operating symbols, light indicators and button labels OK?	<p>4.1. Checks</p> <ul style="list-style-type: none"> PM Checking the tableside control unit for proper functioning and damage PM Checking the fluoro and exposure footswitch for proper functioning and damage PM Checking the system footswitch for proper functioning and damage PM Checking the collimator control elements
3. Electrical checks	n.a.
3.1 Measurement of ground wire resistance	<p>5.1 Ground wire test</p> <ul style="list-style-type: none"> SI Checking the ground wire
3.2 Unit leakage current or equivalent unit leakage current	It is not necessary to measure the unit leakage current due to the fixed mains connection and installation of the heavy current system according to DIN VDE 0107.
3.3 Measurement of patient leakage current or equivalent patient leakage current	The patient leakage current is not be measured as expressly specified by the manufacturer.
4. Mechanical checks	n.a.
4.1 Are all wall, ceiling, and floor mountings secure and undamaged?	<p>2.5 TFT support arm maintenance</p> <ul style="list-style-type: none"> PMP Monitors
4.2 Are all mechanically moved system parts clean and running smoothly (lubricated, if required)?	<p>2.1 Maintenance of the lifting base</p> <ul style="list-style-type: none"> PMP Cleaning and greasing the lifting base <p>2.2 Maintenance of the unit carrier</p> <ul style="list-style-type: none"> PMP Cleaning and greasing the unit carrier PMP Maintenance of the system longitudinal drive <p>2.3 Maintenance of the cassette box</p> <ul style="list-style-type: none"> SI Covers on the catapult bucky PMP Cleaning and greasing the cassettes <p>4.1 Checks</p> <ul style="list-style-type: none"> SI Functional test of safety equipment - electrical/mechanical

"Sicherheitstechnische Kontrollen" Certificate	Maintenance instructions/protocol
4.3 Cables, chains, belts, and spindles without signs of wear	<p>2.1 Maintenance of the lifting base</p> <ul style="list-style-type: none"> • PMP Cleaning and greasing the lifting base <p>2.2 Maintenance of the unit carrier</p> <ul style="list-style-type: none"> • PMP Cleaning and greasing the unit carrier • PMP Maintenance of the system longitudinal drive
4.4 Mobile equipment: Are the wheels, castors and brakes OK?	n.a.
4.5 No noticeable operating noises	Noticeable operating noises generally require troubleshooting by the CSE.
5. Functional checks	n.a.
5.1 Is the emergency switch operational?	<p>4.1 Checks</p> <ul style="list-style-type: none"> • SI Functional test of safety equipment - electrical/mechanical
5.2 Are the warning devices functioning properly?	n.a.
5.3 Do all system movements stop properly in their end positions?	<p>2.1 Maintenance of the lifting base</p> <ul style="list-style-type: none"> • SI Lifting base - checking the safety distances <p>2.2 Maintenance of the unit carrier</p> <ul style="list-style-type: none"> • PMP Cleaning and greasing the unit carrier • PMP Maintenance of the system longitudinal drive • PMP Tabletop transverse - functional test
5.4 Does the collision protection stop system movements properly? (e.g. collision protection)	<p>4.1 Checks</p> <ul style="list-style-type: none"> • SI Functional test of safety equipment - electrical/mechanical
5.5. Are all safety distances (wall, floor, ceiling) met or ensured by other appropriate measures? (e.g. light barriers)	<p>2.1 Maintenance of the lifting base</p> <ul style="list-style-type: none"> • SI Lifting base - checking the safety distances <p>2.2 Maintenance of the unit carrier</p> <ul style="list-style-type: none"> • SI Tabletop longitudinal - checking the safety distances

“Sicherheitstechnische Kontrollen” Certificate	Maintenance instructions/protocol
5.6 Are other safety cutoffs functioning properly? (e.g. safety step plate, door contacts, etc.)	4.1 Checks <ul style="list-style-type: none"> SI Functional test of safety equipment - electrical/mechanical
5.7 Are the table and unit positions reproducible (e.g. zero positions, layer height, etc.)?	n.a.
6. Product-specific checks	2.5 Maintenance of the TFT support arm <ul style="list-style-type: none"> PMP TFT support arm SI TFT support arm PMP Monitors
7. Test result/evaluation	Evaluate the long-term trends of the ground wire resistance by comparing the current measured values to those of the preceding technical safety checks. A sudden or unexpected increase in the measured values indicates a technical safety defect - even if the limit values are not exceeded. Observe the instructions in the "Final Work Steps" chapter. Enter the test results in the “Sicherheitstechnische Kontrollen” Certificate and have it signed by the operator or an authorized representative of the operator. Hand the “Sicherheitstechnische Kontrollen” Certificate to the operator, or a person authorized by the operator.

1.2.4 Maximum tightening torque (table) in Nm

Nominal thread diameter	Screw material			Steel per DIN 267				Brass CuZn alloy
	Property class	4.6	4.8	5.8	8.8	10.9	12.9	
M 3		0.5	0.67	0.83	1.3	1.9	2.2	0.62
M 3.5		0.76	1.0	1.3	2.0	2.8	3.4	0.95
M 4		1.1	1.5	1.9	3.0	4.2	5.1	1.4
M 5		2.2	3.0	3.7	6.0	8.4	10.1	2.8
M 6		3.8	5.1	6.4	10.2	14.4	17.3	4.8

Nominal thread diameter	Screw material			Steel per DIN 267				Brass CuZn alloy
M 8		9.5	12.6	15.8	25.3	35.6	42.7	11.9
M10		18.7	24.8	31.1	49.8	70.0	84.0	23.3
M12		32.9	43.8	54.8	87.6	123.3	147.9	41.1

- When checking the tightness, use the corresponding torque values for property class 8.8. A tolerance of 10% is allowed for torque values.

1.2.5 Aids

- Standard service tool kit
- Ground wire tester 51 38 727 Y0766
- ESD equipment, type 8501, 3H 97 02 606 RE999
- Crosshair 96 60 051
- Film envelope or cassettes
- Precision filter (2.1 mm Cu) 99 00 598
- Ruler (30 cm accuracy min. 1% and 2 m accuracy min. 2%)
- Vacuum cleaner with nozzle
- Lint-free cleaning cloths
- Brush to apply grease
- Alcohol
- Brush to remove dust
- Multimeter (measuring range 1 to 20 volts DC, min. accuracy 1%), e.g. Fluke 8060A 97 02 101 Y4290
- Manual grease gun and nozzle with tip (comprised of two Part Numbers) 77 57 516/77 57 524
- Torque wrench up to 100 Nm 44 30 906 RH090
- Dynamic test kit 37 90 156 X1963

1.2.6 Lubricants

- Loctite 221 (for threaded connectors) 20 48 874
- WD40 contact spray (spray bottle, 400 g) (cleaning agent and rust protection for rails) 28 70 061 RE008
- Viscogen KL 300, 50 grams 73 95 353 RH090
- Longtime PD2 (tube 20 g) (pressure lubricant for long-term lubrication of bearing cages, open ball bearings, chains, cables, etc.) 34 91 271
- Mobiltemp SHC100 (linear guide) 34 99 894 Z999

1.2.7 Cleaning

- Hakapur cleaning concentrate, 0.5 liters (cleaning agent for plastic, glass and enameled parts) 96 69 648 RH999

1.2.8 Components concerned

- Collimator
- Basic unit
- FLC Image System
- Cassette take-up
- TFT monitor support arm

1.2.9 DHHS Regulations

- This document does not replace the UROSKOP Access Maintenance Instructions "Maintenance Instruction/ Measurement Certificate" in countries in which DHHS Regulations apply.

1.2.10 Corrective measures / adjustments

- The SSW is referenced several times in this document for corrective measures and adjustments.
- In addition, the "Adjustments", etc. must be started in the XCS-SSW under "Components/UROSKOP Access".

1.2.11 Covers

- Certain procedures require that you remove the applicable covers first.

1.2.12 Starting FLC Service

NOTE

This subchapter refers exclusively to the FLUOROSPOT Compact image system.

The FLC SSW is intended exclusively for Siemens service personnel and is protected by a password.

- Select the "Adjustments" user card in the patient list ("Patient" user card).
- Select the "Service" radio button (Fig. 1 / p. 15).
 - The following screen will appear (Fig. 2 / p. 15).



Fig. 1: Service button

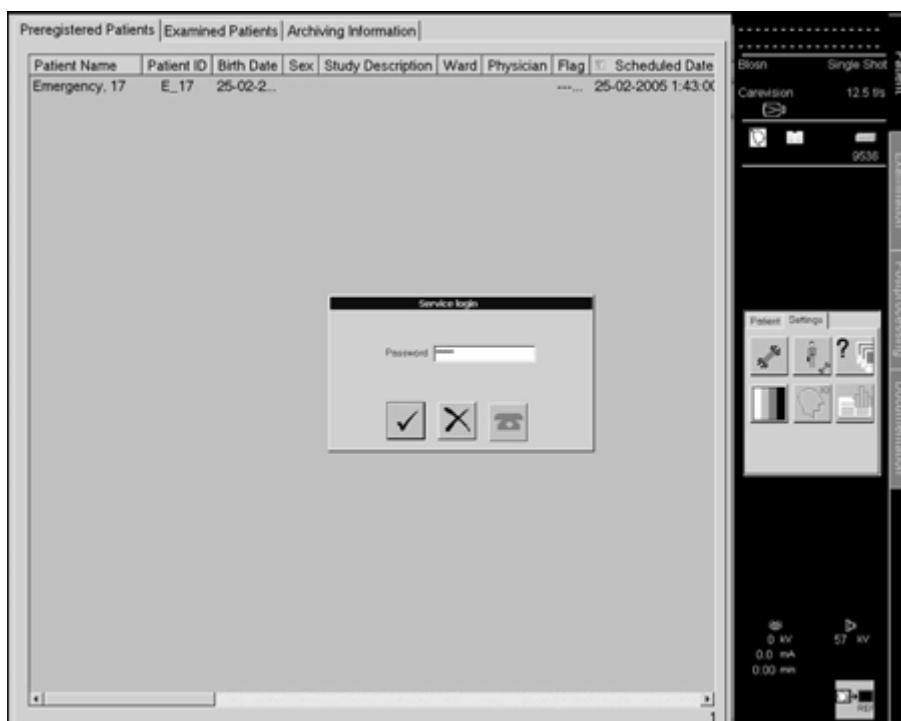


Fig. 2: Service login

- Enter the service password and confirm it by selecting the "Checkmark" radio button.
 - The service password is comprised of the last 6 characters of the variable XCU password. The variable password is administered by the CS HSC Licensing Center or by USC/RSC in the countries.
 - If the service password was accepted, the following service menu window appears (Fig. 3 / p. 15).



Fig. 3: Service menu

1.3 Safety Information

1.3.1 General Safety Information



Risk of property damage, injury, death

Noncompliance can lead to property damage, injuries or death.

- ⇒ Observe the general safety information in this document and in the document TD00-000.860.01 as well as the safety information defined in ARTD, Part 2.

1.3.2 General Safety Information, Electrical



Electrical Safety!

Noncompliance can lead to property damage, severe injuries and even death.

- ⇒ After opening the cover panels, the parts under voltage are accessible. To avoid risks, switch off power to the system prior to opening cover panels. If work steps must be performed using electrical power, the general safety information per TD00-000.860.01 must be observed.



Electrical Voltage!

Noncompliance can lead to property damage.

- ⇒ When working on the system, ESD regulations must be observed.

1.3.3 Safety Information, Radiation



X-ray Radiation!

Noncompliance can lead to illnesses, irreversible damage to body cells and to chromosomes, severe injuries and even death.

- ⇒ When performing work steps on the system for which radiation must be released, the radiation safety guidelines and the rules regarding radiation safety according to ARTD-002.731.02 must be observed.
- ⇒ Make sure that: available radiation protective devices are used. Radiation protective clothing is worn. Keep the distance to the radiation source as great as possible. Trigger radiation only when necessary. Set the adjustment parameters as low as possible (low kV and mA values, brief radiation time). Radiation is triggered as briefly as possible.

1.3.4 Safety Information, Mechanical



Risk of burning on hot parts or components!

If not observed, slight to moderate injuries, especially to the hands, can occur.

- ⇒ After opening the cover panels, parts and components (e.g. power components, cooling units) are accessible that can have temperature of > 50°C during operation.
- ⇒ To avoid burns, switch the system off prior to touching parts or components and let them cool at least 5 minutes.



Risk of injuries from mechanical parts!

If not observed, slight to medium injuries, especially to the hands, can occur.

- ⇒ After opening the cover panels, parts such as boards, screws, cut cable ties, edges of components can be touched which, if care is not taken, can cause crushing, scrapes and cuts to the skin, particularly to the hands.
- ⇒ Perform the particular work steps with special care and attention to detail.
- ⇒ If needed, wear gloves.

1.3.5 Safety Information, Risk of Infection



Risk of infection by bacteria/viruses!

Noncompliance can lead to severe injuries and even death.

- ⇒ **This product can be contaminated by infected blood or other bodily fluids.**
- ⇒ **Avoid all contact with blood or other bodily fluids!**
- ⇒ **Strictly observe the safety information in ARTD-002.731.37 regarding prevention of infectious diseases during customer service calls.**

2 Basic Unit

2.1 Maintenance of the lifting base

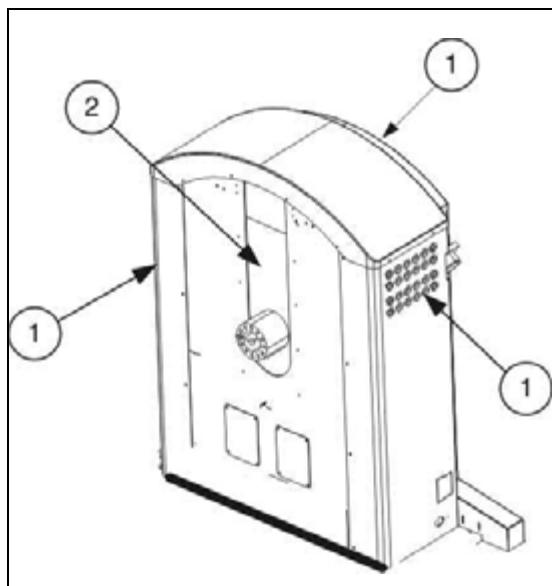


Fig. 1: Lifting base, complete

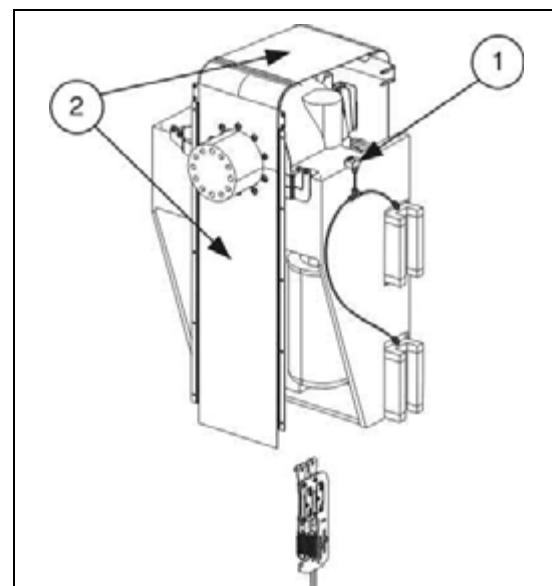


Fig. 2: Lifting base drive

PM Analyzing the error log

- Use the SSW to read out the error log, save it and evaluate it.
- Initiate any corrective measures.
- Clear the error log.

PMP Checking the basic unit

- Check the basic unit for damage.
- Clean the unit inside and below the tabletop where accessible.

SIM Checking the cables and corrugated hoses

- Check the cable and the corrugated hoses for damage.

PMP Cleaning and greasing the lifting base

- Clean the ventilation grate (1/Fig. 1 / p. 19).
- Clean all accessible areas of the cover, especially the plastic band (2/Fig. 1 / p. 19)(2/Fig. 2 / p. 19).
- Clean all accessible locations of the potentiometer drives and grease them lightly with PD 2. Check the mechanical play of the potentiometers.

Required: minimum play.

- Clean all accessible locations of the chains and grease them lightly with KL 300.

- Regrease the linear guide at the central grease fitting (1/Fig. 2 / p. 19) (manual grease press filled with Mobiltemp SHC100). For this, perform a lift with the grease gun. Then make absolutely sure to move the drive all the way up and down. Repeat this procedure 3 times.
- Clean all accessible contact surfaces and apply a thin film of WD 40. Then wipe away any excess oil.

SI Lifting base - checking the safety distances

- Move the tilt drive to 0°/-90°. Move the lift drive to the min.

Required: distance from I.I. to floor at least 4 cm

- Raise the tilt drive up to the max.

Required: Distance between the switch strike plate and safety switch at least 3 mm

Required: distance from tabletop (unit support strut) to floor at least 14 cm

- Raise the tilt drive down to the max.

Required: Distance between switch strike plate and safety switch at least 3 mm

Required: Distance from tabletop (unit support strut) to floor at least 14 cm

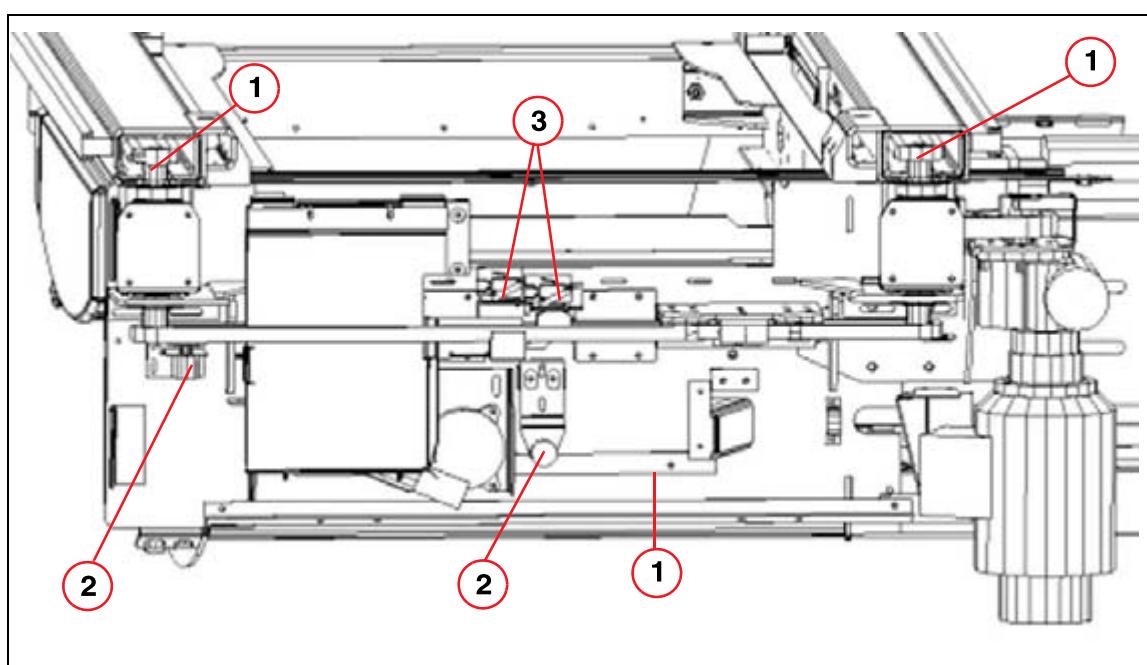


Fig. 3: Unit carrier

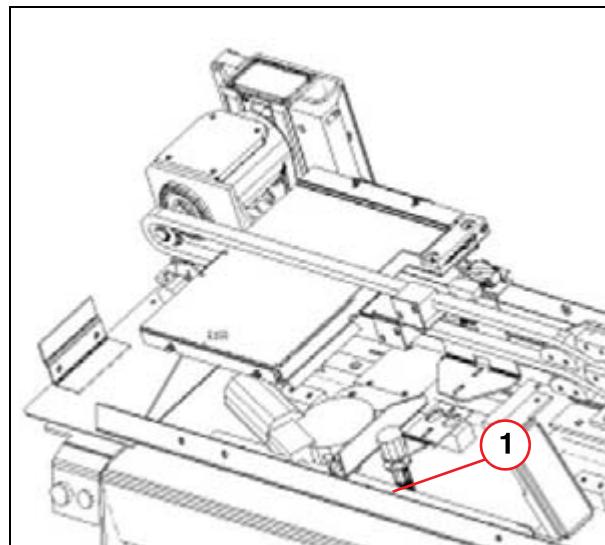


Fig. 4: Unit carrier, bottom view

2.2 Maintenance of the unit carrier

PMP Cleaning and greasing the unit carrier

- Clean all accessible locations of the pinions and chains ([1/Fig. 3 / p. 20](#)) and ([1/Fig. 4 / p. 21](#)) and grease them lightly with PD 2. Check the potentiometers for mechanical play ([2/Fig. 3 / p. 20](#)).
- **Required:** minimal play; the potentiometers must engage properly.
- Check all limit switches ([3/Fig. 3 / p. 20](#)).

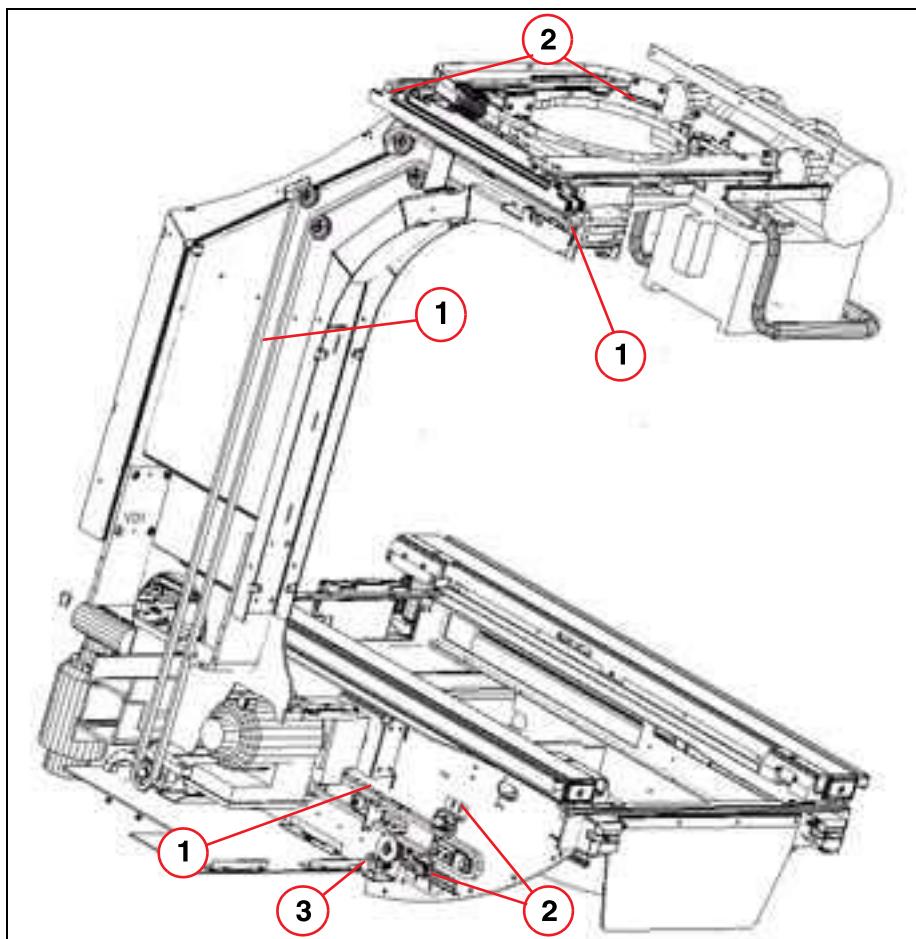


Fig. 5: System longitudinal drive

PMP Maintenance of the system longitudinal drive

- Clean all accessible locations of the chains ([1/Fig. 5 / p. 22](#)) and grease them lightly with KL 300.
- Clean all accessible surfaces and lubricate them with WD 40. Then wipe off any excess oil.
- Clean all accessible locations of the pinions ([Fig. 5 / p. 22](#)) and grease them lightly with PD 2. Check the mechanical play of the potentiometers.
- **Required:** minimal play; the potentiometers must engage properly ([3/Fig. 5 / p. 22](#)).
- Clean all accessible locations of the chains ([2/Fig. 5 / p. 22](#)) and grease them lightly with KL 300.

- Clean all accessible areas of the cover under the tabletop.
- Check all limit switches (2/[Fig. 5 / p. 22](#)).

SI Tabletop longitudinal - checking the safety distances

- Move the tabletop longitudinal drive to the max. head and foot ends. The safety distance to the wall or to the first obstruction (cabinets, etc.) must be at least 50 cm.

NOTE

Regarding safety distances, the country-specific safety regulations must be observed.

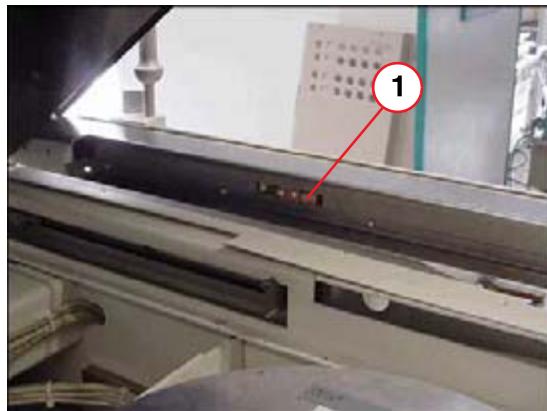


Fig. 6: Tabletop

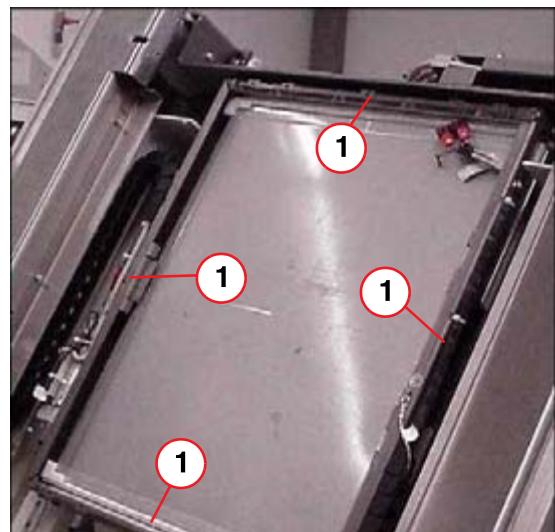


Fig. 7: Cleaning and lubricating the cassette

PMP Patient Table Sealer Ring

- Move the tabletop to the left with left-hand systems or to the right with right-hand systems until the sealer ring is visible (1/[Fig. 8 / p. 24](#)).
- Check the sealer ring for damage and for even position on the cover panel.

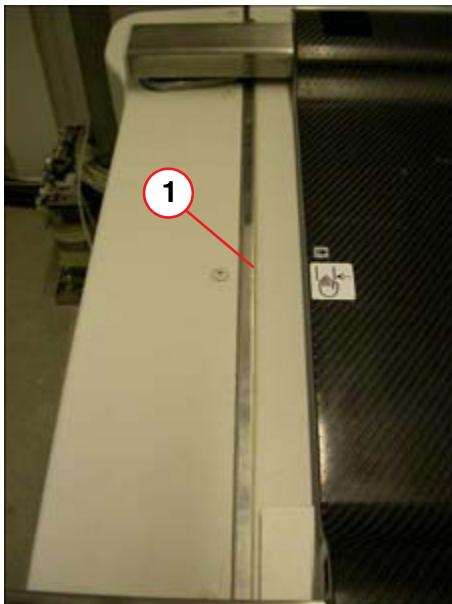


Fig. 8:
Pos. 1 Sealer ring

PMP Tabletop transverse - functional test

- Move the tabletop in the transverse direction all the way from the operator's side to the wall side and vice versa.

Required: Safe approach and braking of the drive is ensured. A hard collision against the end stops is not acceptable.

SI Tabletop

- Lift the patient tabletop, clean the two wiper contacts and check them for function (grounding) (1/Fig. 6 / p. 23).

2.3 Maintenance of the cassette box

SI Covers on the catapult bucky

- During maintenance, remove any dirt that is not accessible to the customer's cleaning personnel. Soften contrast medium residue with water and remove it.
- When removing the cover panels, look for any damage.
- All cables and corrugated hoses that are accessible without further disassembly, including those inside the component, must be checked for damage, proper shielding connection, and strain relief.
- Reconnect all ground wires to the cover panels during when reinstalling them.

PMP Cleaning and greasing the cassettes

- Clean all accessible locations (1/Fig. 7 / p. 23).
- Clean the cassette box, if accessible.

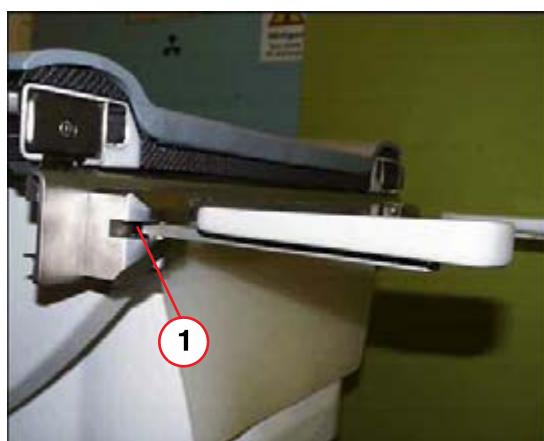


Fig. 9: Elbow supports

2.4 Maintenance of the elbow supports

SI Checking the elbow supports

- The two elbow supports ([1/Fig. 9 / p. 25](#)) must not fold out when the unit is tilted upright into the 90° position. If the spring tension is not sufficient, washers must be inserted. The specified spring tension is approx. 20 N.

2.5 Maintenance of the TFT support arm

NOTE

Beginning 01/2005, UROSKOP Access will be shipped with a new model TFT support arm.

PMP TFT Support Arm

- Maintenance of the spring arm (for the model prior to shipment date 01/2005 as well as after 01/2005) is to be performed according to the Ondal (Ondal Acrobat 3000) Company operating instructions as well as the installation instructions from the Ondal Company.

SI TFT Support Arm

- The safety inspections (for the model prior to shipment date 01/2005 as well as after 01/2005) are also to be performed according to the previously described manufacturer documents (Ondal).

PMP Monitors

- Check the attachment of the TFT monitors to the support arm.

3 Automatic format, collimation, image quality

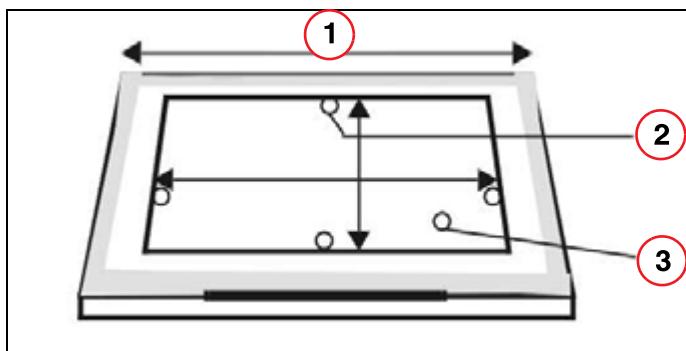


Fig. 10: Radiographic cassette

Pos. 1 Length

Pos. 2 Marker

Pos. 3 Side marker

3.1 Coincidence of light field / radiation field

NOTE

Films should be inserted into both cassettes per the following work steps.

- Move the unit and column to the 0° position.
- Select semiautomatic (for height and width) (**only ASPIA image system**).
- Position a 24 cm x 30 cm cassette with film inserted on the tabletop using the light field.
- Set the light field to exactly 18 cm x 24 cm (operation is performed at the collimator).
- Switch on the light localizer.
- Place a washer or a coin at each of the outside edges of the light field.
- Mark the center with a washer or a coin.
- Place an additional washer or coin on the cassette as a side marker.
- Insert the 2.1 mm Cu precision filter Cu into the collimator.
 - Do not place any additional prefilters in the collimator.
- Also insert another 24 cm x 30 cm or 10" x 12" cassette with film.
- Check the collimator display for the set values of 18 cm x 24 cm.
- Select the following generator settings (**only ASPIA image system**):
 - 70 kV;
 - middle Iontomat chamber;
 - Universal screen;
 - Small focus.

- Select the following generator settings (**only FLC image system**):
 - Select the **Examination** tab and select **Uroskop Cassette, 70 kV and 320 mAs** in the selection menu for the **Settings** tab (Fig. 11 / p. 30).

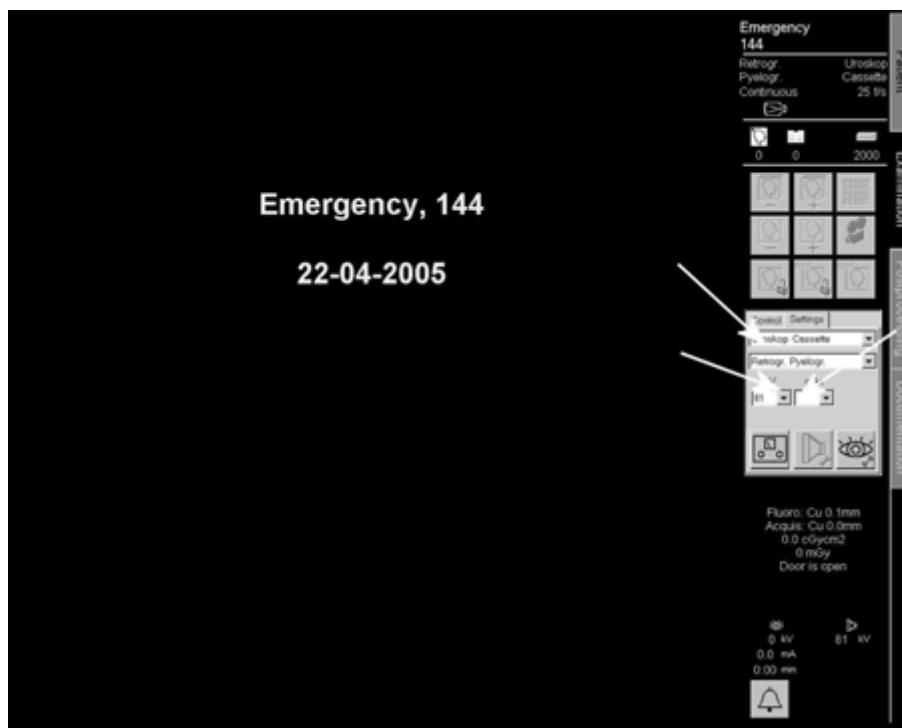


Fig. 11:



- Trigger DR.
- Develop the film/films.
- Label the film/films as follows:
 - Date

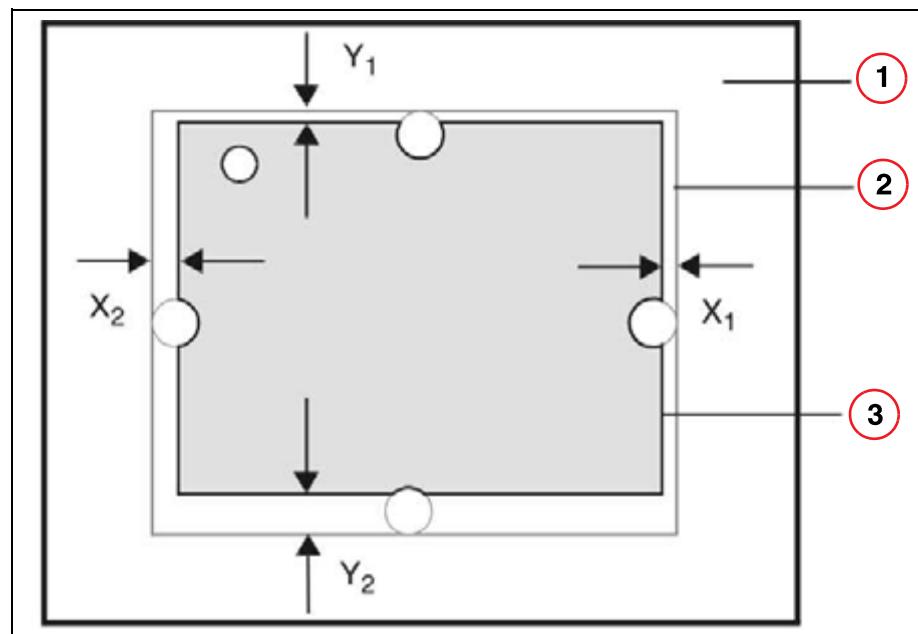


Fig. 12: Coincidence of light field / radiation field

- Pos. 1 Film
- Pos. 2 Light field
- Pos. 3 Radiation field

3.2

Evaluation

NOTE

Use the developed film from the tabletop for the following evaluations.

QIQ Coincidence of light field - radiation field (applies for both image systems)

⇒ Measure the values for X1, X2 and Y1, Y2:

Required: None of the values may be greater than 2.1 cm, e.g. with SID = 107 cm.

This corresponds to 2 % of the SID

(2 % of 107 cm = 2.1 cm)

QIQ Coincidence of Radiation Field - Displayed Field Sizes

NOTE

The dimension Y = 19 cm and X = 24 cm are the exact set values of the light field on the collimator.

⇒ Measure the radiation field on the film:

Required: the radiation field in the "Y" direction must measure between 15.9 cm and 20.1 cm.

This corresponds to 2% of the SID

(2.1 cm is 2% of the SID = 107 cm)

$18 \text{ cm} \pm 2.1 \text{ cm} = 15.9 \text{ cm} (20.1 \text{ cm})$

⇒ Measure the radiation field on the film:

Required: the radiation field in the "X" direction must measure between 21.2 cm and 26.8 cm.

This corresponds to 2% of the SID

(2.1 cm is 2% of the SID = 107 cm)

$24 \text{ cm} \pm 2.1 \text{ cm} = 21.9 \text{ cm} (26.1 \text{ cm})$

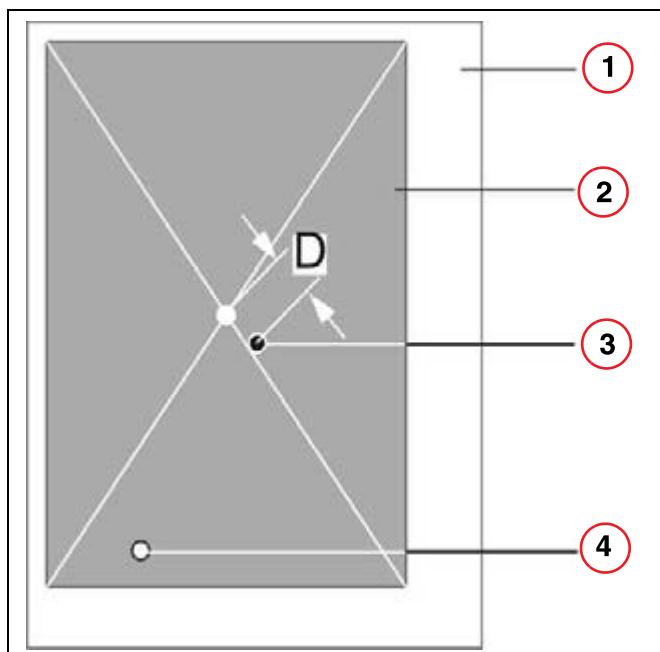


Fig. 13: Radiation field / film center

Pos. 1 Film format
Pos. 2 Radiation field
Pos. 3 Metal washer - cassette center
Pos. 4 Side marker

QIQ Coincidence of radiation field center / film center

NOTE

Use the developed film from the spotfilm device (cassette as an option) for the following evaluation.

NOTE

The SID for systems without cassette is 115 cm, with cassette it is 121 cm.

⇒ Measure the dimension D:

Required: Dimension D may be 2.1 cm.

This corresponds to 2 % of the SID

(2% von 115 cm/121 cm = 2.3 cm/2.4 cm)

QIQ Checking the fluoroscopic field limitation

- Move the unit into the +0° position.
- Perform the following check for each of the different I.I. formats:
 - Trigger fluoroscopy and open the collimator all the way.



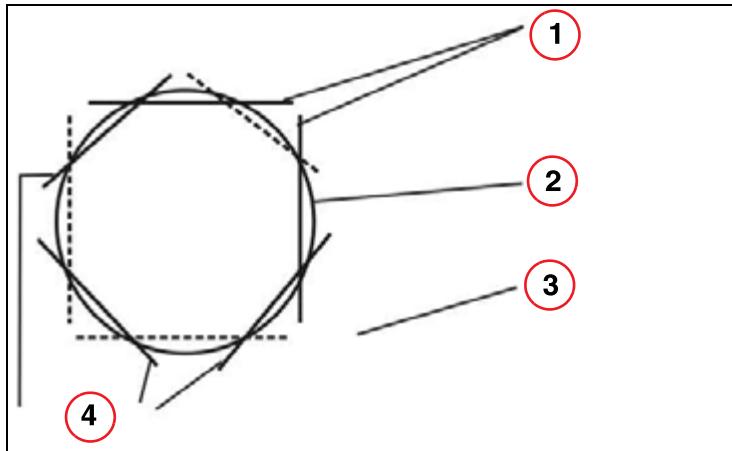


Fig. 14: FL limitation

Pos. 1 Collimator leaf
Pos. 2 Blanking circle
Pos. 3 Monitor
Pos. 4 Iris diaphragm leaves

- Evaluate the appearance of the collimator / iris plates on the monitor for all zoom formats (Fig. 14 / p. 34).

For collimators with iris:

- ⇒ At least 2 collimator leaves (one for height and one for width) and at least 3 iris diaphragm leaves must be visible.
- For all I.I. formats where the plates are not visible as defined above, overframing must be determined as follows:

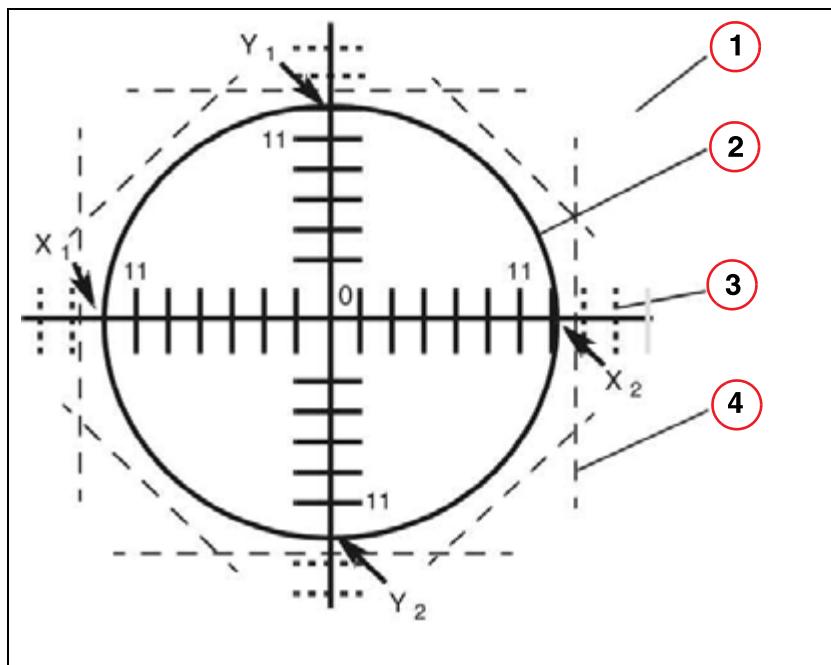


Fig. 15: Crosshair

- Pos. 1 Monitor
- Pos. 2 Blanking circle
- Pos. 3 Crosshair
- Pos. 4 Collimator leaves

- Place the centering cross on the tabletop with the X axis horizontal.

- If needed, first remove the patient mat.



- Trigger fluoroscopy, collimate a radiation field of 5 cm x 5 cm, and adjust the centering cross so it is exactly centered to the radiation field.



- Open the collimator all the way.
- Trigger fluoroscopy.
- Read the cm divisions for X1 + X2, Y1 + Y2 in the width (X direction) and length (Y direction) on the centering cross from the image on the monitor under fluoroscopy.



- Remove the centering cross.
- Place a 35 cm x 35 cm cassette with film on the tabletop.
- Switch fluoroscopy on for approx. 20 s with the max. collimator opening until sufficient film density is reached.
- Prepare a test film, develop it and label it.

⇒ Measure the radiation field size for the X direction and for the Y direction:

Required: Overframing versus the fluoro monitor field may not exceed 2.1 cm in the X and Y directions.

The following applies for a SID of 115 cm: The crosshair is 107 cm from the focus;

Consequently: $2\% \text{ of } 107 \text{ cm} = 2.1 \text{ cm}$

3.3 Image quality

QIQ Image Quality, ASPIA Image System

- The image quality must be checked according to the document "Qualitätssicherung; System; Bildqualitäts-Quick-Test".

QIQ Image Quality, FLC Image System

NOTE

Not all system parameters need to be checked according to the document "Qualitätssicherung; IQAP; für FLUOROSPOT Compact Bildsystem".

The checks to be performed are explicitly mentioned here in this document.

4 General Work on the Unit

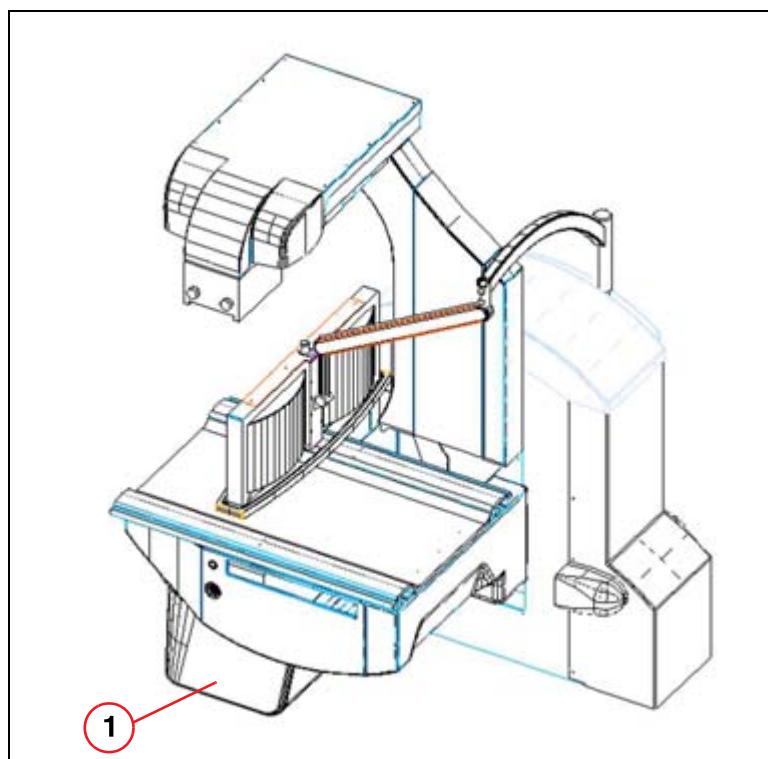


Fig. 16: I.I. collision protection

4.1 Checks

SI Functional test of safety equipment - electrical/mechanical

- Press the I.I. contact safety device (1/Fig. 16 / p. 37).
 - The safety contactor drops out.
- One after the other, press the emergency stop button on the cassette box and on the control panel.
 - The safety contactor drops out.
- Place the footrest on the head end and foot end.
 - There must be easy and secure engagement in all possible stop locations.
- Check for proper functioning of any other safety cutoffs (such as door contacts, safety step plate).
- Check all accessories for function and for wear.

PM Checking the tableside control unit for proper functioning and damage

- Check the function of the tableside controller per SSW (menus in the SSW: Diagnostic/Tests/Checking displays and controls/Tableside control test for the control buttons; Diagnostic/ Tests/Checking displays and controls/Tableside control test for the LEDs).



PM Checking the fluoro and exposure footswitch for proper functioning and damage.

PM Checking the system footswitch for proper functioning and damage.

PM Checking the collimator control elements

- Check for proper function of all displays and controls (according to the operating instructions).

SI Warning labels

- Check the warning labels for completeness and condition.
 - Replace the warning labels if they are illegible.

5 Maintenance of the FLUOROSPOT Compact

PM Cleaning the Image System Container

- Clean the freely accessible surfaces of the container, if soiling is found.

QIQ Checking the Iris Setting

NOTE

Under no circumstances should the Put to Unit button be pressed, because this will cause the iris to be out of adjustment.

NOTE

If differences in the B-Signal/actual value sent by FL C. value from the specified tolerance range 110 ± 10 are found during the following check, perform an adjustment per the document “Qualitäts- sicherung; IQAP; für FLUOROSPOT Compact Bildsystem” (subchapter 5-5 bis 5-7) durchzuführen.

NOTE

If differences in the adjustment values for Video mode (Gamma) during the following check, perform the adjustment per the document “Qualitätssicherung; IQAP; für FLUOROSPOT Compact Bild- system” (subchapter 3-6).

- Start the FLC service menu.
- Select the **Examination** tab and then the **Adjustments** tab.
- Select the **Exposure Program** button.
- Download the default values for each Service OGP (Service OGP 1 to Service OGP 4) as described below.
 - Select **Service OPG 1**.
 - Select the **Store default value** button.
 - Save using the **Save** button.
 - Confirm the **Enter password** window with **OK**.

NOTE

The parameters for Service OGP are listed in the chapter 9 in the “Qualitätssicherung; IQAP; für FLUOROSPOT Compact Bildsystem” document.

- Start the XCS SSW and select “Adjustment/TV param”.
 - The following window appears.

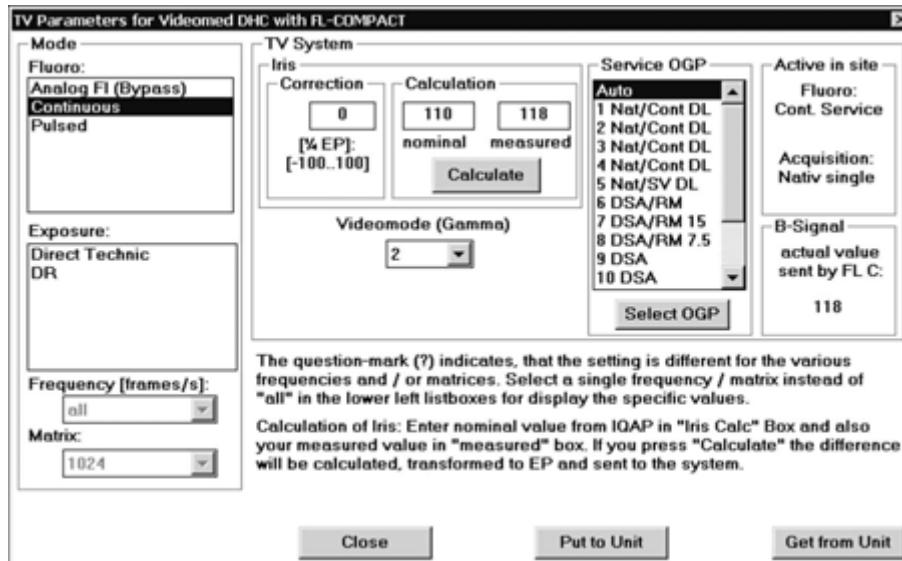


Fig. 17: XCS SSW, Adjustment/TV param

- Select **Service OGP 1** in the FLC service mode.
- Select “Continuous” in the XCS SSW in the submenu “Mode/Fluoro:”.
- Check whether “2” is selected under “Videomode (Gamma)”.
- Insert the 2.1 mm Cu precision filter into the collimator.
- Select Zoom 0 (full format).
- Trigger DL for approx. 10 sec., while doing so, open the collimator completely.
- Read the value under “B-Signal/actual value sent by FL C.”.
 - ⇒ The value must be **110 ± 10**.
- Repeat the check for all zoom formats (only for **Service OGP 1**).
 - ⇒ The value for **B-Signal/actual value sent by FL C.** must be **110 ± 10**.
- Repeat the check for all pulse frequencies (under “Frequency [frames/s]:”; (Fig. 17 / p. 40)) as described below.
 - To do this, select the corresponding Service OGP (see the following table).
 - Select “Pulsed” in the XCS SSW in the “Adjustment/TV param” menu under “Mode/Fluoro:”.
 - Select the pulse frequency in the “Frequency [frames/s]” submenu for the particular Service OGP (corresponding to Tab. 1 in the column **Fluoro Mode**).

Tab. 1 Service OGP

Service OGP	Fluoro Mode	Exposure Mode	Video Mode (Fluoro)	Video Mode (DR)
OGP 1	Continuous	DR (6 f/s)	2	5
OGP 2	Pulsed (12.5 f/s)	DR (1 f/s)	2	5

Service OGP	Fluoro Mode	Exposure Mode	Video Mode (Fluoro)	Video Mode (DR)
OGP 3	Pulsed (8 f/s)	DR (1 f/s)	2	n.a.
OGP 4	Pulsed (3 f/s)	DR (1 f/s)	2	n.a.



- Check whether **2** is selected under **Video mode (Gamma)**.
- Trigger fluoroscopy for approx. 10 s.
- Read out the value under **B-Signal/actual value sent by FL C.**
 - ⇒ The value must be **110 ± 10**.
- Also check the pulse frequency under “Mode/Exposure/DR” for Service OGP 1 and Service OGP 2.
 - To do this, select the corresponding Service OGP (see Tab. 1).
 - Select “DR” in the XCS SSW in the “Adjustment/TV param” menu and in the sub-menu “Mode/Exposure”.
 - Select the pulse frequency in the “Frequency [frames/s]” submenu for the particular Service OGP (see Tab. 1 in the column **Exposure Mode**).
 - Check whether **5** is entered under **Video mode (Gamma)**.
 - Trigger DR.
 - Read the value under “B-Signal/actual value sent by FL C.”.
 - ⇒ The value must be **110 ± 10**.
 - Close the XCS SSW window with **Close**.



QIQ Checking the Image System using the Dynamic Test

- Perform the dynamic test per the document “Qualitätssicherung; IQAP; für FLUOROSPOT Compact Bildsystem” (chapter “TV-System, Videomed DHC”).

QIQ Checking the Monitor Settings

- Check the monitors per the document “Qualitätssicherung; IQAP; für FLUOROSPOT Compact Bildsystem” (chapter “Monitore”).

6 Final work steps

6.1 Ground wire test

SI Checking the ground wire

- Perform the ground wire check after installing all cover panels per DIN VDE 0750, Part 1 (ARTD Part 2). Here, the ground wire resistance in the normal operating status of the system must be measured from the ground wire connection clamp on the system side to all conductible parts of the system that can be touched.

The values determined must be documented and evaluated together with information regarding the measuring device used (designation and serial number).

The ground wire resistance must not exceed 0.2 Ohms.

NOTE

Evaluate the results of the ground wire test by comparing the first measured value to the values documented during preceding maintenance procedures or safety checks.

A sudden or unexpected increase in the measured values indicates a defect in the ground wire connections (ground wire or contacts) - even if the limit value of 0.2 Ohms is not exceeded.

NOTE

Make sure that control cables or data cables between the components of the system do not imitate any ground wire connections.

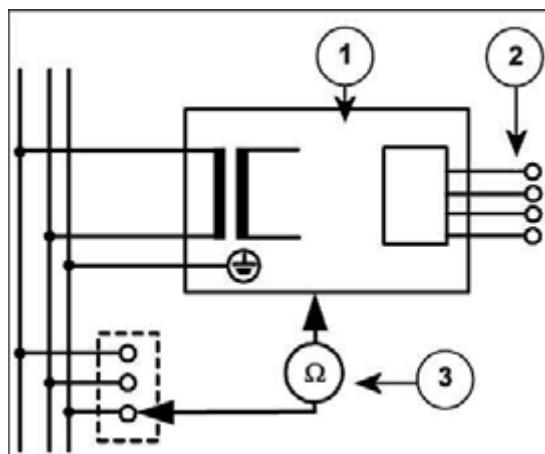


Fig. 1: Measuring circuit for measuring the ground wire resistance in systems that are permanently connected to the power supply net (per DIN VDE 0751-1:2001-10, Fig. C3).

Pos. 1 System
 Pos. 2 Application Component, Type B
 Pos. 3 Measurement Setup (integrated into test meter)

6.2 System Leakage Current Measurement

NOTE

A measurement of the unit leakage current or equivalent unit leakage current can be skipped for the Uroskop Access when the effectiveness of the safety measures for indirect contact in the high voltage system as defined by DIN VDE 0107 is met.

7 Changes to Previous Version

Chap. 1	Subchapters "Required Documents", "Aids", "Affected Components", "Abbreviations" rewritten; subchapter "Applicability of UROSKOP Access Version" positioned in another location in the document; subchapter "Product-specific Safety Information" rewritten and renamed to "Safety Information".
Chap. 3	Completely rewritten.
Chap. 5	new.
Chap. 6	Completely rewritten.